Plant in Focus, September 2017

Microseris walteri Murnong

1. Introduction

Murnong *Microseris walteri* was an important plant in the life of Aboriginal people in Western Victoria and other parts of south eastern Australia. Its tubers provided a consistent supply of energy-rich food for more than half the year. It was widespread, prolific and easy to harvest because the tubers grow close to the soil surface.

The Murnong is a yellow-flowered daisy in the milky sap tribe (Cichorieae, also called Lactuceae), of the daisy family Asteraceae. Like many daisies its small seed sit below a parachute of bristles. This ensures the wind catches the seed, separating it from the plant and carrying it some distance.

The rich volcanic soil of Western Victoria provided an ideal growing medium for these plants, and for grazing sheep.

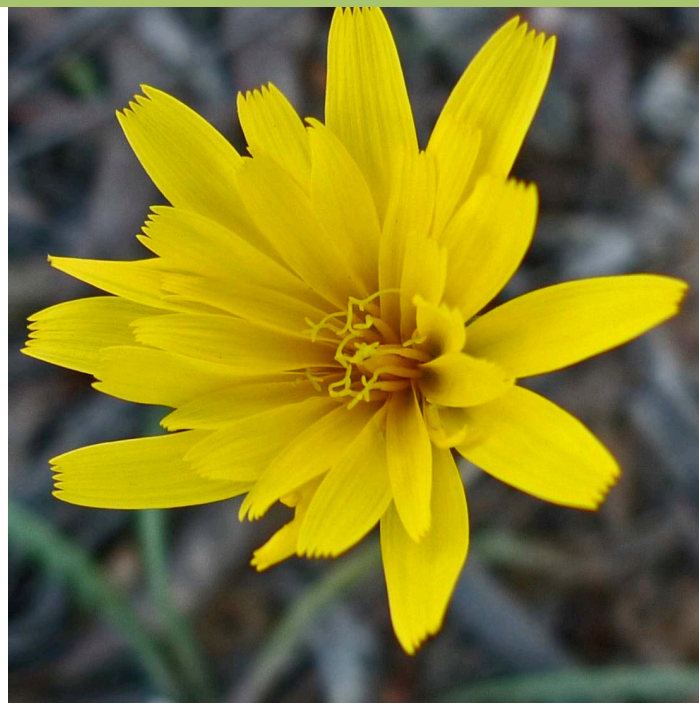
The Murnong tubers allow the plant to survive the hot dry summer conditions in the relative cool below the surface. New shoots appear with the rain in late autumn or early winter. This growth depletes the tuber. A new tuber begins to form once the plant's leaf growth is well established.

The shrivelling old tubers and tiny new ones are not very nutritious, so there are a few months when they cannot be eaten.

2. Aboriginal food use

In 1803, when Collins tried to establish a settlement on the eastern side of Port Philip Bay, a convict, William Buckley, escaped and lived with aborigines for 32 years. Buckley lived with the Aborigines on Thomson's Creek, also known as Bream Creek, on the Bellarine Peninsula. It flows into Buckley's Bay 18km south of Geelong.

Some years later Buckley told Mr Malcolm that 'a man may live on the root for weeks together'. He was probably the first European to see the importance of this plant as food for aborigines. Early accounts describe the Murnong as being abundant.



1. Murnong *Microseris lanceolata* flower head, NSW
(Image captions show the species name recorded with the specimen. See discussion on naming.)

2. A tuber is developing among the roots of Murnong *Microseris scapigera,*
GBG Nursery, August 2017

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As the tubers have a sweet, pleasant taste, raw or cooked, they became a staple food for aborigines in the areas where they were abundant. In such areas it only took an hour's work to dig 8 kg of tubers, enough to feed a family that day.
Women collected the tubers using a pointed digging stick. This was relatively easy because the tubers are close to the surface. Children were taught to dig for tubers as soon as they could walk.
To prepare the tubers, women first made a rush basket. They put washed tubers in the basket and the basket put into an earth or mound oven in the evening for next morning's breakfast. Often several families cooked together. Their combined harvest could be a pile of baskets one metre high.
In some areas this resulted in a sweet dark-coloured juice, called 'minni'. The sugar in this juice allowed more of the nutrients in the tubers to be digested.
Like Jerusalem Artichoke tubers, much of the carbohydrate in the Murnong is **inulin** which cannot be digested by humans. It can be partially broken down into digestible sugars by cooking. Bowel bacteria break down inulin more completely. However, the gas by-product can cause flatulance and abdominal pain. It is thought that swollen abdomens of some aboriginal children was caused by this gas.

Aborigines ate parts of many plants, including the tubers of Water Ribbons *Triglochin procera*. You can see these plants growing in deeper water around the edge of the Stormwater dam in Eastern Park.
In the 1960s archeologists thought there was very little plant food available to aborigines in Victoria, so they relied on hunting. By the 1980s researchers, such as Beth Gott (see references) had discovered the extensive records showing the importance of plant foods and Murnong, in particular.

3. Seed head of Murnong *Microseris sp.*

4. 'Parachute' fruit of
Murnong *Microseris scapigera,*
GBG Nursery, August 2017.
Compare this seed with Dandelion, later.
The Murnong fruit, containing the seed, does not have a beak separating the fruit from the 'parachute' [pappus].

3. Murnong distribution
Murnong originally grew in an arc from mid South Australia to the Queensland border.
It is possible that aborigines extended its range when they took murnong tubers as food for long treks. Some have suggested that they may have spread in disturbed ground the way related daisy plants, like dandelion, do. Of course the seed were blown to new areas, suspended under their parachute of bristles.

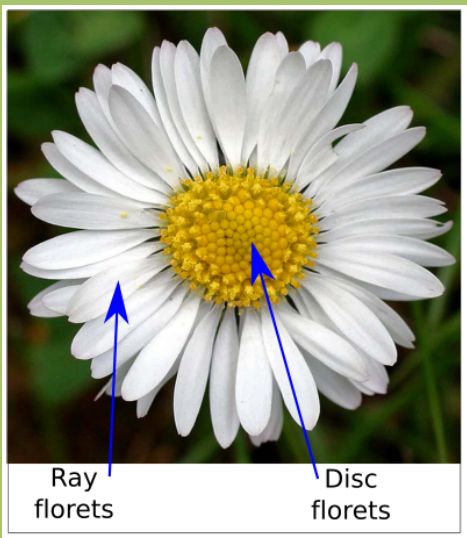
Why didn't the Murnong become depleted by such intensive harvesting? It has been suggested that in harvesting from the clumps of stems and tubers, some would have been left behind. These would have grown strongly in the disturbed soil. This is similar to the garden practice of thinning clumping plants.
Murnong areas were burned in Victoria during the dry season. This cleared away dead leaves, leaving an open area, fertilised by ash suitable for growth when the rain came. The tubers underground were not affected by the fire, allowing the plants to regenerate during the late autumn, early winter growing season.

4. Decline
European settlement began around Port Philip Bay in 1835, attracted by land suitable for grazing sheep. Sheep numbers grew very quickly. In their first year in Murnong areas, the sheep fed almost exclusively on the leaves and tubers. Within 5 years the Murnong were gone. Some commented that sheep couldn't get at the tuber underground, but the sheep soon learned to unearth them with their noses.
Murnong were not the only plants depleted. Many of the grassland plants had no resistance to new hard-footed sheep and cattle, nor reserves to cope with the excessive stock numbers. Ultimately perennial summer grass such as Kangaroo grass *Themeda triandra* were replaced by introduced winter annual grass and weeds.

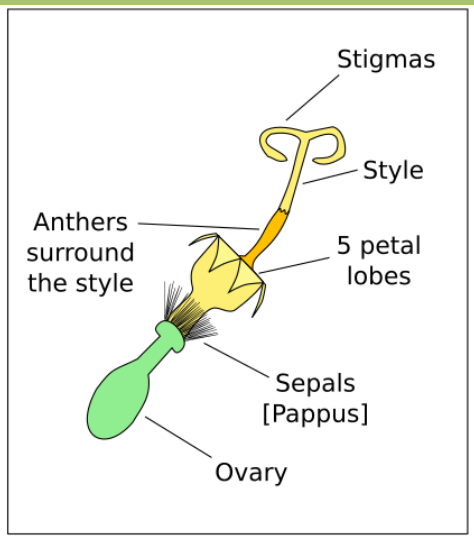
5. Plant of Murnong *Microseris lanceolata*
GBG Grassland Seed Bed, August 2017.
Leaves are very variable in form.
Flower buds about to open.

If you look at the grassland under the trees in Eastern Park, you get an idea of what an area depleted of native species looks like.
The loss of Murnong tubers and other plants left aborigines with no vegetable food. They were also denied access to their hunting grounds and sea food collecting areas, so they were forced to accept flour and sugar from the settlers.
These losses resulted in poorer diet, declining health and declining aboriginal population.
By the 1850s, young people were singing a song: 'Blackfellows saw flowers, some said they were yam blossoms, some said no. They took them to the old man, who said they were, so they dug them up.' These young people had only seen Murnong's introduced relative, Flat Weed *Hypochaeris*.

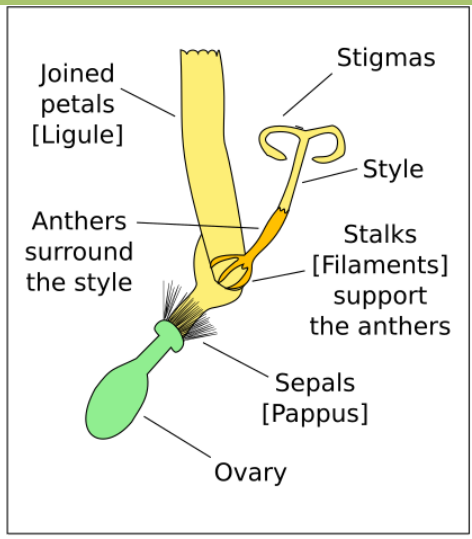
5. Geelong Botanic Gardens (GBG) role in restoring the lost grassland flora
Grasslands are among the most endangered natural areas worldwide. The grasses, the other plants (called forbs) and the animals are either endangered or extinct. In Victoria, the last remaining grasslands are on country roadsides, railway reservations and a few farm areas considered of low productivity.
Greening Australia is an organisation restoring native environments across Australia. (www.greeningaustralia.org.au). GBG is working with Greening Australia though the establishment of seed beds to produce seeds of endangered grassland plants for sowing in restoration areas.



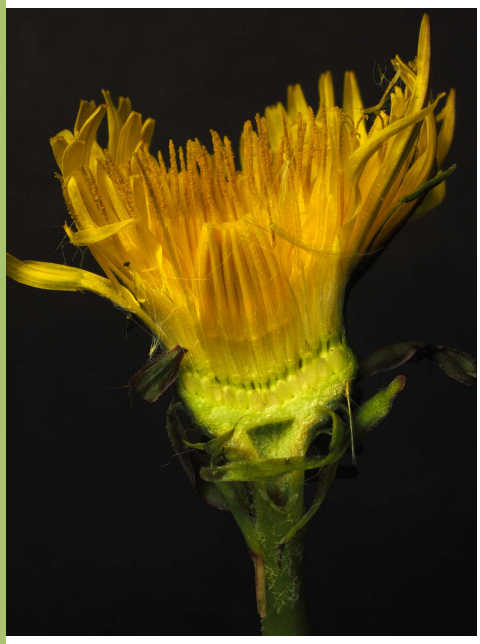
6. This daisy flower head has two types of floret



7. Disc floret has rotational symmetry



8. Ray floret has bilateral symmetry



9. Left: Section through Dandelion showing all are disc florets

10. Disc florets of Sunflower *Helianthus sp*. showing the petal lobes

11. Ray floret of Dandelion *Taraxacum sp.* The tribe Cichorieae, that includes *Microseris* and *Taraxacum* has only 1 type of floret.

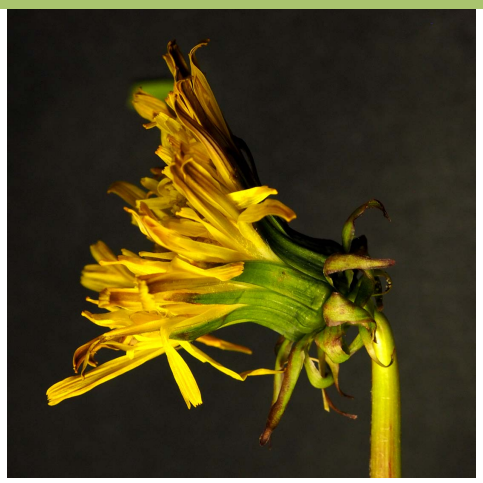
6. Botany: Murnong's place among the daisies

Clearly Murnong is a member of the daisy family, Asteraceae. This is the largest plant family with 32,913 species accepted in The Plant List. Daisy flower heads [capitula] all have many tiny flowers [florets] packed together to form an inflorescence surrounded by many small leaves [involucral bracts].

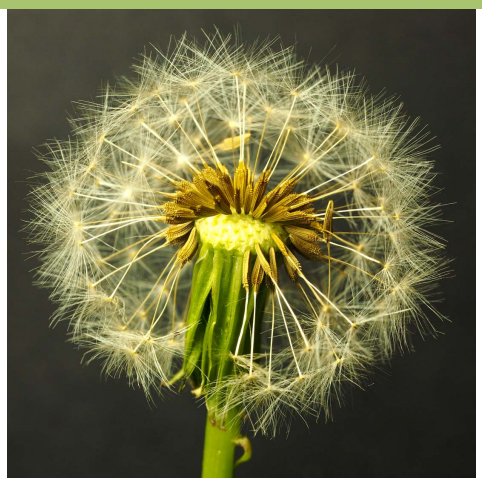
The flower head can have two types of floret, disc florets in the centre and ray florets surrounding them. However, the Murnong and its relatives have only one type of floret.

Because of its size, the family Asteraceae has been divide into 12 subfamilies, which have been subdivided into 42 tribes. Murnong is a member of the tribe Cichorieae (also called Lactuceae), named for two members *Cichorium intybus* Chicory and *Lactuca sativa* Lettuce. The members of this tribe have milky latex. All genera, except two, only have ray florets. A significant feature of the tribe is that 1,600 of its species reproduce sexually, but more than 7,000 (including the Dandelion *Taraxacum*) reproduce by seed that don't require fertilisation [apomixis]. Most have yellow flowers.

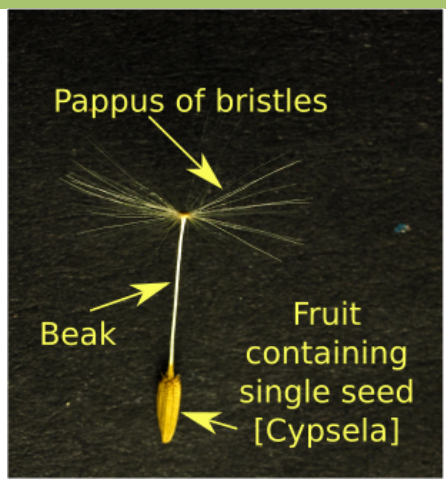
The majority of *Microseris* species originate in North America, with a handful from Australia, NZ and the Channel Islands. The majority of *Microseris* species in Australia are introduced.



12. Dandelion flower head showing involucre of bracts surrounding the florets



13. Dandelion seed head showing the fruit attached to the receptacle



14. Dandelion seed 'parachute'

7. Botany: Naming the Murnong

Aboriginal people from different places gave this plant different names, although many in Victoria had words similar to Murnong.

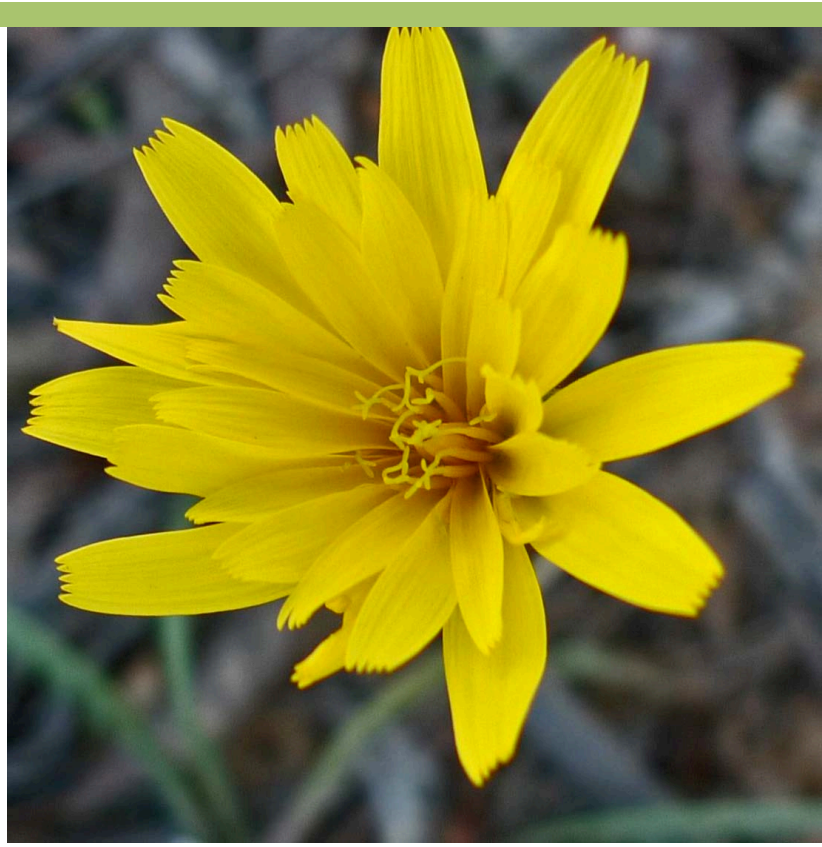
Only in 2016 was the botanical name for this important Aboriginal food plant, *Microseris walteri*, clarified. For more than 30 years it was known as *Microseris sp. 3* or *M. lanceolata* or *M. scapigera*. Walsh in 2016 has resurrected an existing name for Murnong, *Microseris walteri*, and clearly defined the differences between the 3 Victorian species, as shown in the table.

The Murnong plants growing in the GBG are currently labelled with the two previous species names: *M. lanceolata* growing in the grassland seed bed and *M. scapigera* growing in the Nursery.

Feature	M. walteri	M. lanceolata	M. scapigera
Tuber	single tuber present	absent	absent
Fleshy roots	only single root that becomes the tuber	several	present
Roots		branching just below ground level	usually branch close to the leaves
Fruit [Capsela]	usually less than 7 mm long	usually less than 7 mm long	mostly 7-10 mm long
Pappus bristles	c. 10 mm long 0.5 – 1.3 mm wide at base	10-20 mm long c. 0.3 - 0.5 mm wide at base	30-66 mm long
Joined petals [Ligule]	usually more than 15 mm long	usually more than 15 mm long	to 12 mm long
Origin	lowlands of temperate southern WA, SA, NSW, ACT, Vic, Tas	rarely on basalt soils; alpine and subalpine NSW, ACT and Vic	mostly from basalt plains of western Vic and elevated sites in Tas

Geelong Botanic Gardens Map

8. Murnong Summary
Family: Asteraceae
Sub-family: Chicorioideae
Tribe: Cichorieae (also called Lactuceae)
Genus: *Microseris*
Species: *Microseris walteri*
Common names: Murnong, Yam Daisy
Origin: Endemic in a wide band from the NSW-Queensland border to mid South Australia, with a few pockets in Western Australia.
Location in GBG: Grassland seed raising beds in the Annexe next to the 20th Century garden. Named *Microseris lanceolata* when planted.



9. References

The Plant List, a collaboration between the RBG Kew and the Missouri Botanical Garden, shows the accepted botanical names http://www.theplantlist.org. Accessed 8 September 2017.
Greening Australia www.greeningaustralia.org.au
'Microseris scapigera: a study of a staple food of Victorian Aborigines', 1983, Beth Gott, Australian Institute of Aboriginal Studies and Botany Department, Monash University.
'A name for Murnong' (Microseris: Asteraceae: subfamily Cichorioideae), Neville Walsh, Royal Botanic Gardens Victoria, Muelleria 34: 63-67, 2016
Atlas of Living Australia website at http://www.ala.org.au/page name. Accessed 8 September 2017.

10. Image credits

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